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SN 11/723,075

Docket No. S-102,315

In Response to Office Action dated 04/16/2008

REMARKSClaim Status

Claims 1-4 are pending in the present application.

Rejections

1. Rejection Under 35 USC §103(a) Over U.S. Patent 4,277,323 (Muller), in view of Volkov et al. (CAS abstract for SU patent 1247740 7-1986)

The Office Action rejects claims 1-3 under 35 U.S.C. 103(a) as being unpatentable over Muller in view of Volkov, asserting that it would have been obvious to one of ordinary skill in the art at the time of the invention to utilize the teaching of Volkov for the sensor of Muller to yield the predictable result of having an oxygen sensor. The Office Action further asserts that with respect to the sensor being a hydrocarbon sensor that this is only the intended use of the apparatus and the intended use need not be given further due consideration in determining patentability. The Office Action further states that with respect to the electrolyte body being compressed and sintered about the metal oxide, the determination of patentability for the claim is based on the product itself, and further because the product of the claim is identical to the invention of Muller and Volkov the process from which it was made is the same as or obvious over the process utilized by Muller and Volkov. Applicants strongly disagree with these assertions. Applicants further believe that the present rejections are cumulative and present no new bases for rejection that were not considered prior to Appeal.

First, the assertion that "a hydrocarbon sensor" is only the intended use of the object is in error. "A hydrocarbon sensor" forms the preamble to the claim, and is necessary to give meaning to the claim.

Preamble language that merely states the purpose or intended use of an invention is generally not treated as limiting the scope of the claim. However, the preamble is regarded as limiting if it recites essential structure that is important to the invention or necessary to give meaning to the claim. That is, if the claim drafter "chooses to use both the preamble and the body to define the subject matter of the claimed invention, the invention so defined, and not some other, is the one the patent protects."

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Bicon, Inc. v. Straumann Co., 441 F.3d 945 (Fed. Cir. 2006), internal citations omitted.

Applicants have repeatedly explained in previous Responses why the structure of the present invention renders it suitable for use as a hydrocarbon sensor, and why the oxygen sensor of Muller fails to provide any useful information to one of skill in the art attempting to solve the problem of producing a reliable hydrocarbon sensor. Applicants have further explained why Muller is unsuitable to combine with any reference to form the basis for an obviousness rejection. Because all rejections in the Office Action rely on Muller, Applicants believe that all present rejections under 35 U.S.C. 103(a) are improper.

The sensor of Muller is applied to one surface of an insulated carrier plate or substrate. See Muller, Col. 1, lines 65-68. The carrier plate is an essential element of Muller's invention, is pervious to oxygen molecules (porous), and the oxygen molecules pass through the substrate to reach the electrodes. See Muller, Col. 2, lines 3-7. Whereas such a construct may work for oxygen molecules, which are relatively stable, this would not allow detection of hydrocarbons. As is explained on page 2, line 24 through page 3, line 3 of the Applicants' specification, when a hydrocarbon is forced to meander through pores of a material, it may be catalyzed in the presence of oxygen to non-hydrocarbon products. This reduces sensitivity. To solve this problem, the present invention relies on eliminating the need for the hydrocarbon to diffuse through a porous material for detection (see specification, page 2 lines 15 - 17). This is accomplished by the 3-phase interface formed, in part, by "a metal oxide electrode body contained within the electrolyte body and having a first electrode surface coplanar with the first electrolyte surface, wherein the electrolyte body is compressed and sintered about the metal oxide electrode body for intimate contact therebetween. Compression and sintering result in sufficient ionic-conductivity for the electrolyte (specification, p. 5, lines 19-21), and thus are important in formation of the 3-phase interface. A compressed and sintered electrolyte body refers not only to a process, but to the product itself, namely a compressed and sintered body. Thus, the Office Action's assertion "[w]ith respect to the electrolyte body being compressed and sintered about the metal oxide, the determination of patentability for the claim is based on the product itself," is contradictory.

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Second, the claimed invention is not identical to that which would result from combining Muller and Volkov. The Office Action states that Muller discloses a sensor comprising an electrolyte body 32 having a first electrolyte surface with a reference electrode 30 depending therefrom and another electrode body 31 having a first electrode surface coplanar with the first electrolyte surface (referring to Figure 1, col. 1, line 64 – col 2, line 3 and to col 4, lines 16-23). First, Muller refers to elements 30 and 31 as electrodes and gives no indication that element 30 is a reference electrode. Muller indicates that both electrodes may be platinum electrodes (col. 3, line 51). Assuming that platinum may be indicative of a reference electrode (as asserted by the Office Action on page 4, paragraph 6), and both electrodes are platinum, then it is unclear how one can be a reference electrode and the other a non-reference electrode. However, assuming for the sake of argument only that element 30 is a reference electrode, it does not “depend from” the electrolyte body, as required by Applicants’ claims, but is interdigitated or interleaved with electrode 31 (col. 3, lines 48-49).

More important, Applicants’ invention claims a metal oxide electrode body contained within the electrolyte body and an electrode surface coplanar with the electrolyte surface. Muller teaches electrodes deposited onto an electrolyte body (see col. 4, lines 60-64 which discusses how the electrodes may be applied). It is unclear how an electrode can be deposited onto and at the same time be contained within an electrolyte body. In addition, the electrodes are surrounded by a gas-impervious insulating layer 33, which is “applied over the electrodes and over the narrow sides of the carrier 29...The insulating layer also covers the electrodes, the space therebetween and the electrically conductive tracks...”. Col. 4, lines 11-14. The electrodes do not appear to be contained within the electrolyte body, but are at least partially surrounded by an insulating layer, which in turn may be sintered. Col. 4, lines 64-65 (“The entire sensor is integrated by sintering”). Therefore, there is no teaching of an electrolyte body compressed and sintered about the electrode. This is an entirely different construct than Applicants’ claimed invention, and as explained in previous responses, would fail to result in Applicants claimed invention when combined with any other reference and any other electrode material, including those taught in Volkov.

For references to be available under 35 U.S.C. 103(a), the combination of references must at least teach all elements of the claimed invention. Here, there is no

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teaching of an electrode body contained within the electrolyte body, no teaching of an electrolyte body compressed and sintered about the electrode, and no teaching of a reference electrode depending from the electrolyte. In addition, there must be some suggestion or motivation for one of skill in the art to combine the references and one of skill in the art must have at least a reasonable expectation of success. Because Muller fails to teach a construction suitable for a hydrocarbon electrode, and fails to teach the three-phase interface construction of Applicants' claimed invention, one of skill in the art would not be motivated to look to Muller to combine with any other reference. Therefore, the combination of Muller and Volkov meet none of these criteria.

2. Rejection Under 35 U.S.C. §103(a) Over Jakobs et al. (Ionics, 2, 1996, pp 451 - 458) in view of U.S. Patent 4,277,323 (Muller)

The Office Action rejects claims 1-3 under 35 U.S.C. 103(a) over Jakobs in view of Muller, asserting that Jakobs does not explicitly disclose that the metal oxide electrode body is contained within the electrode body.

Applicants refer to the arguments presented above with respect to Muller, and add the following. The Office Action asserts that Muller teaches that the electrodes are embedded within the electrolyte body. "Embedded" is not the same as "contained within," as embedded may also imply a partial containment wherein the electrodes are not coplanar. Indeed, this is what Figures 1 and 2 indicate, as well as the explanation of the construction of the electrodes with respect to the electrolyte discussed above. In addition, the explanation in Muller given of how the electrodes are constructed does not appear to describe how the electrodes are embedded, but rather describes methods for depositing and coating with an insulating layer.

In regard to Jakobs, this reference also teaches neither an electrode body contained within the electrolyte body, nor an electrolyte body compressed and sintered about the electrode for intimate contact therebetween. Therefore, this combination of references fails to teach all elements of Applicants' claimed invention, and one of skill in the art would not be motivated to look to either reference to solve the problem of the hydrocarbon sensor of the present invention.

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3. Rejection under 35 U.S.C. §103(a) in view of Muller in view of Volkov or Jakobs in further view of U.S. Patent 4,755,274 (Mase et al.)

The Office Action rejects claim 1 under 35 U.S.C. 103(a) over Muller in view of Volkov or Jakobs in further view of Mase. For the reasons stated above, it would not be obvious to combine Muller with either Volkov or Jakobs. Therefore, it would be similarly non-obvious to combine any of these references with Mase. Any material substituted into the combination of Muller and Volkov or Jakobs would fail to result in Applicants' claimed invention. For this reason, Applicants request withdrawal of this and all other rejections under 35 U.S.C. 103(a) and allowance of claims 1-4.

Respectfully submitted,

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